

III. *Revision of the Mexican and Central American Chauliognathinae (Fam. Telephoridae), based on the genital armature of the males.* By GEORGE CHARLES CHAMPION, F.Z.S.

[Read March 4th, 1914.]

PLATES III—VIII.

SINCE the conclusion of the Rev. H. S. Gorham's work on the Mexican and Central American *Chauliognathinae*, in 1885, a great deal of additional material has accumulated, necessitating a complete revision of the numerous forms described by him. For this purpose the aedeagus of the male of each species has been examined, and figured, good differential characters having been found to be present in the genital armature. As might be expected, far too much importance has been attached to colour by nearly all writers on the subject, and the real structural characters, in consequence, overlooked. About a dozen so-called species are here sunk as synonyms or varieties, but the deficiency is nearly made up by the forms now added, bringing the number to 40, one (*Chauliognathus morio*, Gorh.) having to be erased as not belonging to the region. No attempt, it may be observed, seems to have been made since Leconte's time to revise the N.-American *Chauliognathini*, two more of which (*C. marginatus*, F., and *C. discus*, Lec.) are here added to the Mexican list. The group, or subfamily, may be characterised thus:—mentum elongate; gular sutures confluent; tarsal claws simple; dorsal segments 1-7 of the abdomen each with a circular pit at the outer apical angle of the reflexed lateral margin, 8 simple; aedeagus of ♂ with a very stout twisted median lobe, and asymmetric rigid lateral lobes (one of which is sometimes wanting), covered by an oval convex cap, which (as seen from the ventral aspect) is more or less emarginate on the left side, the last ventral segment broadly cleft down the middle for its reception. The subfamily *Chauliognathinae* as thus defined includes *Chauliognathus*, Hentz (type *Telephorus pennsylvanicus*, De Geer), *Xenismus*, Waterhouse (type *X. nigroplagiatus*,
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from Ecuador, the male of which is unknown), and *Daiphron*, Gorham (type *D. lyciforme*), and so far as at present known is mainly confined to the New World, a few species from New Guinea, Australia, and Lord Howe Island excepted.

The Lyciform Tropical American insects placed by Gorham under *Daiphron* mimic some of the Lycids of the same regions; but in one of them the mimicry is confined to certain varieties of the female only. Then again, amongst the *Chauliognathi*, with which *D. proteum* must be placed, there are forms mimicking, in one (*C. corvinus*) or both (*C. morio*) sexes, various Lampyrids of the genera *Photinus*. These divergences from the Chauliognathid type (which are even better illustrated, as regards the Lampyridiform facies, in *Discodon*, of the subfamily *Telephorinae*), in one or both sexes, are of particular interest, considering the abundance of the feeble sluggish Lycids and Lampyrids in the same country; the predatory *Chauliognathinae*, however, to judge from the special glands along the margins of their abdomen, may be equally distasteful to certain enemies. *C. procerus*, Bourg., from New Guinea, and the Australian species, including *Telephorus pulchellus*, MacLeay, referred to *Chauliognathus* by Bourgeois,* as well as the allied *T. apterus*, Olliff, from Lord Howe Island, differ from the American forms in having the median lobe of the aedeagus much less twisted and the asymmetric lateral lobes peculiarly shaped, the left lobe (as seen directed forwards) being greatly developed in *C. procerus*, etc. The general structure of the aedeagus, therefore, indicates that the Australian and New Guinea insects (seven species of which have been dissected) should be treated as generically distinct from *Chauliognathus*. The circular pit at the outer apical angle of each dorsal abdominal segment (not to be confused with the transverse spiracles, which are placed near the inner edge of the reflexed portion of the same segment, or on the membranous space connecting the two surfaces) is the outlet of a secretory gland, from which a liquid or offensive odour is doubtless emitted by the insect in life. In certain American genera of *Telephorinae* with greatly abbreviated

* Bull. Soc. Ent. Fr. 1910, p. 126. Females only were known of the two New Guinea insects described by him. Additional species from that Island have since been described by Pic (*op. cit.*, 1911, pp. 197-199).

elytra, *Maronius* and *Belotus*, the walls of this pit are drawn out into long oblique tubular processes, and in *Maronius* the aedeagus is asymmetric, and covered by a convex cap; but these genera differ from the *Chauliognathinae* in the form of the terminal abdominal segment, etc.

The aedeagus* of the males of the *Chauliognathinae* is very different in structure from that of the *Telephorinae*, and owing to the twisted median lobe and the asymmetric lateral lobes copulation must of necessity be lateral. The very stout median lobe and the tegmen appear to be soldered together, but the basal portion of the former is membranous (figs. 1, 9a, 22a), allowing a certain amount of movement when coition takes place. The left lateral lobe (as seen dissected and directed forwards) is usually longer than, and always differently shaped from, the right lobe, the latter being occasionally wanting (*C. tripartitus*, etc.); and its apex together with that of the spoon-shaped terminal portion of the median lobe forms a pair of claspers for grasping the female during the prolonged copulation. The median orifice is on the distal aspect of the main central lobe, and the more or less evaginated soft internal sac is frequently visible in dried specimens. The immovable lateral lobes vary in structure according to the species, and one or the other of them is sometimes bi- or trifurcate at the tip. When the form of these lobes, which can be seen by lifting the aedeagal cap (= last ventral segment of Leconte and the valvular plate of Gorham), is taken into consideration, it affords in many cases a ready means of discrimination between closely allied species. Figures of these structures are appended to the present paper (Plates IV—VIII), that of *C. procerus* (figs. 44, 44a) being added for comparison with the American forms.† They are taken, and described, from the dissected aedeagus mounted on its ventral surface, with the lobes directed forwards and thus reversed. This is actually the dorsal aspect of the organ, the convex ventral portion, on which aspect the median lobe is membranous at the base, fitting into the concavity of the oval, convex, aedeagal cap.

* Cf. Sharp and Muir, Trans. Ent. Soc. Lond. 1912, pp. 481, 484, 485.

† Cf. Sharp and Muir's figure 139, showing the aedeagus of an unnamed *Chauliognathus?* from New Guinea.

DAIPHRON.

Daiphron, sect. I, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, pp. 66 (1881), 277 (1885).

This genus, type *D. lyciforme*, is provisionally retained for the species with the elytra greatly widened posteriorly in both sexes, the head feebly developed, and the antennal joints 3-11 more or less widened or serrate. The male of *D. proteum*, Gorh., cannot possibly be separated generically from *Chauliognathus corvinus*, which has simple antennae in the male and dilated subserrate antennae in the female. *D. lyciforme* and *D. personatum*, again, have these organs formed very much as in *Chauliognathus sodalis*, so that the antennal structure alone cannot be used to distinguish *Daiphron* from *Chauliognathus*. In addition to the four Central American forms, there are various others from Tropical South America in the Fry collection at the British Museum and in the University Museum at Oxford. The former represent two sections:—

- Antennae, ♂ ♀, very elongate, gradually tapering towards tip, joints 3-10 moderately widened or subserrate *Species 1, 2.*
- Antennae, ♂ ♀, much shorter, rapidly tapering towards tip, the intermediate joints greatly widened and serrate *Species 3, 4.*

1. *Daiphron lyciforme*.

Daiphron lyciforme, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 66, pl. 5, fig. 2 (♀) (1881) (nec *C. lyciformis*, Bourgeois, 1887).

Hab. MEXICO, Chinautla (*Sallé*); GUATEMALA, Alta Vera Paz; NICARAGUA.

Var. *a.* Elytra, prothorax and scutellum ochreous.

Daiphron ochraceum, Gorh., loc. cit. pp. 67, 277 (excl. var.).

Hab. GUATEMALA, Alta Vera Paz; COSTA RICA; PANAMA.

♂. Aedeagus: median lobe obliquely bent, emarginate on the upper edge before the apex, the apex itself produced into a long, spoon-shaped process; left lateral lobe long, feebly sinuate, narrowed to the tip, the latter straight; right lateral lobe stout, longer than the left, curved upwards from about the middle, and produced into a sharp slender tooth at the tip. Plate IV, figs. 1, 1a.

D. lyciforme and *D. ochraceum* simply differ in the colour of the upper surface, like many other *Chauliognathinae*, and they cannot be treated as distinct. A male of each has been dissected, and they prove to have the aedeagus precisely similar in structure. Twelve examples have been examined, and there are others from S. America in the British Museum that probably belong to the same species. The so-called variety of *D. ochraceum*, from Bugaba, noted by Gorham (loc. cit. p. 277), is a perfectly good species, and it has recently been named *D. lineatum* by Pic.

2. *Daiphron personatum*, n. sp. (Plate III, fig. 2, ♂.)

♂. Elongate, widening posteriorly, black, the prothorax (two sinuous mesially coalescent vittae on the disc excepted) and the elytra to beyond the middle (an oblong spot near the suture at the base excepted) reddish-ochraceous, the apical portion of the latter nigro-violaceous, the abdomen ochreous, with the aedeagal cap infusate, the femora above and the tibiae in part fusco-testaceous. Head rather small, obliquely narrowed behind the eyes, the latter rather prominent; antennae long, tapering towards the tip, joints 4-10 moderately widened, 3 barely half the length of 4. Prothorax opaque, transverse, rounded at the sides and sinuate at the base, the angles completely effaced, the lateral and apical margins broadly, and the basal margin narrowly reflexed, the disc sulcate down the basal half and deeply excavate towards the sides. Elytra somewhat shining, at the base of about the same width as the prothorax, and widened from a little below the tumid humeri to near the apex, the apices broadly rounded; densely, rugulose punctate, with two distinct dorsal costae and a similar raised line towards the outer margin.

♂. Aedeagus: median lobe long, strongly curved; left lateral lobe long, broad at the base, and then abruptly narrowed and arcuate to the tip, the latter slightly hooked; right lateral lobe much shorter than the left, compressed, bent outwards, and distinctly hooked at the tip. Plate IV, figs. 2, 2a.

Length (excl. head) 13½ mm.

Hab. HONDURAS (*Dyson, in Mus. Brit.*).

One male, received by the British Museum in 1845. A remarkably distinct form, separable at once from *D. lyciforme* by the strongly rounded sides of the prothorax, the rather shining, distinctly tricostate elytra, and the more slender antennae. The black mark on the disc of the prothorax is H-shaped.

3. *Daiphron lineatum*. (Plate III, fig. 1, ♂.)

Daiphron ochraceum, var., Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 277.

Daiphron ochraceum, var. *lineatum*, Pic, Mélanges exot.-entomologiques, fasc. iv, p. 6 (Sept. 1912).

Very like *D. lyciforme* var. *ochraceum*, Gorh., but much smaller; the prothorax with a narrow black median vitta (as in typical *D. lyciforme*); the antennae much shorter in both sexes, the intermediate joints greatly widened and more strongly serrate (as in *D. crassicorne*); the prothorax narrow, subparallel in ♂, subcampanulate in ♀, the margins narrowly reflexed.

Length (excl. head) 11½-12 mm. (♂ ♀.)

♂. Aedeagus: median lobe obliquely bent, simply sinuate on the upper edge towards the apex, the latter feebly produced; left lateral lobe very elongate, slender, almost straight, feebly hooked at the tip; right lateral lobe nearly as long as the left, compressed, rather broad, angularly dilated just beyond the middle, and with the apex sharply bifurcate, the inner angle produced into a strongly curved, acute hook. Plate IV, figs. 3, 3a.

Hab. PANAMA, Bugaba.

The above description has been taken from a pair in the "Biologia" collection, one or two others having now passed into the hands of M. Pic. The sharply bifurcate shorter right lateral lobe of the aedeagus is characteristic, separating *D. lineatum* at once from the same sex of *D. lyciforme*.

4. *Daiphron crassicorne*.

Daiphron crassicorne, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 67, pl. 5, fig. 24 (♀).

♂. Aedeagus: median lobe curved, feebly produced at the apex; left lateral lobe extremely elongate, slender, sinuate, narrowed at the tip; right lateral lobe short, compressed, obliquely bent, slightly hooked at the apex. Plate IV, fig. 4.

Hab. GUATEMALA, Zapote, Pacific slope.

Described by Gorham from a pair from Zapote. The great disparity in the length of the lateral lobes of the aedeagus brings this species near *Chauliognathus proteus*.

CHAULIOGNATHUS.

Chauliognathus, Hentz, Trans. Am. Phil. Soc., new series,

iii, p. 460 (1830); Leconte, Trans. Am. Ent. Soc. ix, p. 43 (1881); Gorh., Biol. Centr.-Am., Coleopt. iii, 2, pp. 68 (1881), 277 (1885).

Daiphron, sect. II, Gorh., loc. cit. p. 68.

Chauliognathus includes a large number of American forms, the species from New Guinea and Australia referred to it by Bourgeois and Pic probably requiring a separate genus for their reception. It is apparently replaced in the Antilles by *Tylocerus*. The forty species here enumerated (including *C. morio*, which is Brazilian) may be grouped thus:—

- A. Species Telephoriform in ♂, Lyciform in some of its varieties in ♀; head large in ♂, small in ♀; antennae rather short, the intermediate joints broadly widened and subserrate in both sexes. [DAIPHRON, Gorh., part.] . . . *Species 1.*
- B. Species Telephoriform in ♂, Lampyriform (*Photinus* or *Photuris*) in ♀; antennae in ♂ subfiliform, gradually tapering towards tip, in ♀ shorter and with intermediate joints widened and subserrate *Species 2.*
- C. Species Lampyriform (*Photinus*) in both sexes; antennae, ♂ ♀, short, and with intermediate joints broadly widened and subserrate* [Species 3.]
- D. Species Telephoriform in both sexes [=CHAULIOGNATHUS, s. str.].
- a. Elytra long, ample, subparallel or slightly rounded at sides, usually covering the abdomen.
- a¹. Antennae very elongate, tapering towards tip, the intermediate joints much widened: species very large *Species 4.*
- b¹. Antennae very elongate, slender, subfiliform, joints 9–11 widened in ♂; head and prothorax shining, the latter large; aedeagus of ♂ with one of the lateral lobes wanting: species large† *Species 5.*
- c¹. Antennae filiform or subfiliform in both sexes, sometimes narrowed towards the tip *Species 6–18.*

* One or two other Brazilian forms belong to this section.

† *C. luctuosus* (Latr.) and some other S.-American forms belong to this section.

- b. Elytra gradually narrowed posteriorly, lanciform or subulate, usually not quite covering the abdomen; antennae filiform or subfiliform, often longer in ♂ . . . *Species* 19-33.
- c. Elytra somewhat abruptly subulate, usually covering the abdomen; antennae filiform or subfiliform *Species* 34-38.
- d. Elytra subulate, short, not nearly covering the abdomen in either sex; antennae filiform or subfiliform *Species* 39, 40.

1. *Chauliognathus proteus*. (Plate III, figs. 3, ♂, 4, ♀.)

Daiphron proteum, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, pp. 68, 277, pl. 5, figs. 14, 15, 16; Pic, *Mélanges exot.-entomologiques*, fasc. vi, p. 9 (July, 1913).

♂. Aedeagus: median lobe obliquely bent; left lateral lobe very elongate, sinuate, acuminate and slightly hooked at the tip; right lateral lobe short, compressed, obliquely bent at about the middle, and produced into a rather long curved hook at the apex. Plate IV, figs. 5, 5a.

Hab. MEXICO, from Durango southward; BRITISH HONDURAS; GUATEMALA; COSTA RICA; VENEZUELA (*ex coll. Fry*).

An abundant insect in Central America, but not yet received from Nicaragua or Panama, and extremely variable in the colour and markings of the elytra, the prothorax, too, wanting the median vitta in some examples, similar variations in colour amongst certain *Chauliognathi* having been given specific rank by Gorham and others. The male has the subparallel general shape of a Telephorid and the female the facies of a Lycid, this being especially noticeable in the form of *Daiphron proteum* selected by Gorham as the type, *i. e.* the one with uniformly brick-red elytra, of which, to judge from the series before me, the male is rare and the female common. The male of the var. *nigripennis*, Pic, is extremely like the same sex of *Chauliognathus corvinus*, Gorh., and the two were found mixed in the "Biologia" collection. The following varieties, all noticed by Gorham, who selected the ochreous form as the type, have recently been named by Pic:—

- 1. Elytra black, with testaceous oblong humeral patch of variable extent (fig. 16 of Gorham) *apicalis*.

2. Elytra black fasciated with testaceous, or testaceous fasciated with black (fig. 14 of Gorham) *bifasciatus*.
3. Elytra testaceous maculated with black along the suture anteriorly *inapicalis*.
4. Elytra testaceous, with a common anterior fascia and an isolated ante-apical mark black. *trimaculatus*.
5. Elytra entirely black, *nigripennis*.

These definitions scarcely include the common form with about the apical third of the elytra black, or the one (from Cuernavaca) with a broad transverse black patch on the disc below the base. A male of each form has been dissected, showing no variation in the structure of the aedeagus, and the accurate specific diagnosis of the author.

2. *Chauliognathus corvinus*. (Plate III, figs. 5, ♂, 6, ♀.)
- ♂. *Chauliognathus corvinus*, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 281.
- ♀. *Telephorus* (*Chauliognathus*?) *haereticus*, Gorh., loc. cit. p. 289.

♂. Head large, broad; antennae moderately long, rather stout, slightly tapering towards the tip; prothorax subquadrate, usually with a very broad median vitta, and sometimes a small spot on each side of it, black; elytra rapidly narrowing posteriorly, varying from wholly black or fuscous to ochraceous with the tip more or less infuscate, rarely fuscous with the sutural and outer margins flavescens; legs usually black, rarely in part testaceous.

♀. Head small; antennae shorter, the intermediate joints broadly widened, rapidly tapering towards the tip; prothorax broader, transverse, more rounded at the sides, usually with a large subtriangular, dark patch on the disc; elytra broader, often dilated towards the middle, nigro-fuscous, fuscous, or fusco-testaceous, the sutural and outer margins often yellow; femora and tibiae testaceous, the tarsi infuscate.

♂. Aedeagus: median lobe obliquely bent; left lateral lobe extremely elongate, slender, bisinuate, feebly hooked at the tip; right lateral lobe very short, compressed, produced into a rather long, narrow, curved hook at the apex. Plate IV, figs. 6, 6a.

Hab. GUATEMALA, San Isidro; NICARAGUA; COSTA RICA; PANAMA.

A common insect in Chiriqu. There can be no doubt

as to the Lampyriform females being the sexual complement of *C. corvinus*, notwithstanding their different general facies. Gorham, moreover, had placed a similarly coloured pair from Chontales under his *C. haereticus*; and amongst the males referred by him to the former there was one *Daiphron proteum* (from San Isidro), showing the close resemblance between one of the forms of that variable insect and typical *C. corvinus*, ♂. The antennae in the females are nearly as broad as in his *D. proteum*. A male from each country has been dissected; they have the very long left lateral lobe of the aedeagus more slender, and the median lobe less produced at the apex, than in the *Daiphron*. *Discodon chiriquense*, Pic, may be a female of this insect.

[3. *Chauliognathus morio*. (Plate III, fig. 7, ♂.)

Chauliognathus morio, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 77 (♀) (1881) (nec *Daiphron morio*, Kirsch, 1888).

♂. Aedeagus: median lobe very stout, curved, produced at the apex into a broad spoon-shaped process; left lateral lobe rather short, broad, compressed, convex at the base externally, concave within, subangularly dilated at a little beyond the middle, and feebly hooked at the apex; right lateral lobe longer than the left, tortuous, abruptly curved from about the basal third, and obliquely acuminate at the tip. Plate IV, figs. 7, 7a.

Hab. BRAZIL, Santa Catharina.

This species, the female only of which was known to Gorham, must be erased from the Central American list; it is an inhabitant of Brazil, as proved by the presence of a pair from Santa Catharina, and other allied forms from Brazil, in the Fry collection. The type (♀), from the Sturm collection, is labelled “? Mexico.” *C. morio* bears an extraordinary resemblance to a large elongate *Photinus*, of the family Lampyridae, as stated by Gorham. The antennae in both sexes are rather short, and have the intermediate joints broadly widened and subserrate, tapering rapidly towards the tip. The three specimens before me (one male and two females) are similar in shape, nigro-fuscous in colour, with the margins of the prothorax and the sutural and outer edges of the elytra flavescent. The prothorax is transverse, narrowed anteriorly, deeply impressed down the middle behind, and with the margins broadly reflexed. A male from Brazil is figured.]

4. *Chauliognathus sodalis*.

Chauliognathus sodalis, Waterh., Trans. Ent. Soc. Lond. 1878, p. 326; Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 69, pl. 5, figs. 8, 9 (♀).

♂. Aedeagus: apical portion of the median lobe very broadly and obliquely produced; lateral lobes stout, moderately long, the left lobe concave, broadly and obtusely dilated beyond the middle within, and with the short, curved, narrow apical portion hooked on the inner side at the tip, the right lobe shorter than the left, constricted on the dorsal aspect before the apex, the apex itself obtuse. Plate IV, figs. 8, 8a.

Hab. MEXICO, Oaxaca.

There are three forms of this fine species: the form, selected as typical by its describer, with the elytra wholly ochreous (fig. 8 of Gorham); var. 1, with the apex of the elytra broadly black; var. 2, similarly coloured, except that the basally dilated black prothoracic median vitta is extended on to the base of the elytra (fig. 9 of Gorham). The antennae are long, dilated, compressed, and taper towards the tip, very much as in the type of the genus *Daiphron*, *D. lyciforme*. The narrow yellow "pygidial plate" mentioned by Gorham is, of course, peculiar to the female.

5. *Chauliognathus tripartitus*.

Chauliognathus tripartitus, Chev., Col. Mex., Cent. ii, fasc. 5, no. 106; Gorh., Biol. Centr.-Am., Coleopt. iii, 2, pp. 71, 278, pl. 5, fig. 4 (♂).

Hab. MEXICO; GUATEMALA; PANAMA.

Var. *α*. Elytra with an ante-median fascia of variable width, rarely interrupted at the suture, yellow. (♂ ♀.) (Gorham's fig. 4.)

Chauliognathus janus, Waterh., Trans. Ent. Soc. Lond. 1878, p. 329 (♀); Gorh., loc. cit. p. 71.

Hab. MEXICO; GUATEMALA; PANAMA; ECUADOR.

Var. *β*. Elytra as in *α*, but with the apex yellow.

Chauliognathus tripartitus, Chev., var., Waterh., loc. cit. p. 327.

Hab. MEXICO; GUATEMALA.

Var. *γ*. Elytra wholly black. (♂.)

Hab. MEXICO; PANAMA.

♂. Antennae very elongate, with the last three joints wider than those preceding.

♀. Antennal joints 3–11 narrow, equal in width.

♂. Aedeagus: median lobe short, very stout, slightly produced at the apex; left lateral lobe short, rather stout, hooked at the apex within; right lateral lobe altogether wanting. Plate V, figs. 9, 9a.

This species differs from all the other Central-American *Chauliognathi* in having the three apical joints of the antennae widened in the male, and in the complete absence of one of the lateral lobes of the aedeagus; the prothorax, too, is very shining and has the margins broadly reflexed. The colour of the elytra is variable, the yellow portion (extending over the basal half in the type of *C. tripartitus*) being sometimes absent. *C. luctuosus* (Latr.) is an allied form, with one of the lobes of the aedeagus also wanting.

6. *Chauliognathus heros*.

Telephorus heros, Guér., Rev. Zool. 1843, p. 18.

Chauliognathus heros, Gorb., Biol. Centr.-Am., Coleopt. iii, 2, p. 277 (♀).

Chauliognathus dimidiatus, Gorb., loc. cit. p. 69 (part.) (♂).

Hab. COSTA RICA; PANAMA; COLOMBIA; ECUADOR; PERU.

Var. *a.* Elytra with about the apical third black.

Chauliognathus rex, Gorb., loc. cit. p. 68.

Hab. MEXICO, Oaxaca; GUATEMALA, Vera Paz.

Var. *β.* Elytra narrowly margined with black at the apex.

Hab. COSTA RICA, Volcan de Poas, alt. 2,000 metres (Pittier, in *Mus. Brit.*).

Var. *γ.* Elytra wholly ochreous or flavous.

Chauliognathus nitidicollis, Gorb., loc. cit. p. 69.

Hab. COSTA RICA.

Var. *δ.* Elytra wholly black.

Chauliognathus heros, var., Waterh., Trans. Ent. Soc. Lond. 1878, p. 326.

Hab. ECUADOR, Quito.

♂. Aedeagus: apical portion of the median lobe produced

into a long, spoon-shaped process; lateral lobes long, sinuous, the left lobe narrowing to the tip, the right lobe longer, broader, and more sinuate than the left, bifid at the apex, the inner produced apical portion acute and claw-like. Plate V, fig. 10.

The type of *C. heros* has the apical half of the elytra black, the black being a little less extended in the northern *C. rex* and altogether wanting in the var. γ (*nitidicollis*, Gorh.); var. β is intermediate between the latter. At Quito, Ecuador, as noted by Waterhouse, a form with uniformly black elytra occurs. The abdomen in the type is yellow, spotted with black along the sides; but the ventral segments, the last excepted, are often more or less nigro-fasciate in all the forms. The relatively broader prothorax of *C. heros*, mentioned by Gorham as a distinguishing character, is simply a female peculiarity. The prothorax itself is always ochreous, with a small, rounded, black central spot; and the surface is shining in some examples and opaque in others, possibly according to the maturity of the insect. One of the dark males before me from Ecuador has subparallel elytra. The structure of the aedeagus is precisely similar in the male of each form.

7. *Chauliognathus dimidiatus*.

Chauliognathus dimidiatus, Waterh., Trans. Ent. Soc. Lond. 1878, p. 330 (♀); Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 69, pl. 5, fig. 3 (♂) (exclud. Costa Rican specimen) (*nec* Dej. Cat.).

Hab. MEXICO, Vera Cruz; NICARAGUA, Chontales.

Var. *a*. The elytra wholly black, the prothorax fuliginous, paler along the reflexed margins.

Hab. ECUADOR, Paramba.

♂. Aedeagus: apical portion of the median lobe produced into a long, spoon-shaped process; left lateral lobe very elongate, feebly sinuate, and armed with a short tooth at the apex within; right lateral lobe shorter and more strongly sinuate than the left, angularly dilated before the apex, and armed with a stout hook on the dorsal aspect just before the bifid tip (the apex thus appearing trifid, when viewed from in front). Plate V, figs. 11, 11a.

This species has the entire upper surface duller than in *C. heros*, and the prothorax (which varies a good deal in shape, irrespective of sex) wants the central spot. The

abdomen is variable in colour. The Central American specimens (seven females and three males seen) are similarly coloured above; but in Ecuador an almost wholly black form is not uncommon. Of this dark variety there is a long series in the British Museum, found by Mr. Rosenberg, at Paramba, alt. 3,500 feet, in April, 1897, during the dry season. The male of this dark form has the aedeagus shaped exactly as in the three Nicaraguan specimens of the same sex of typical *C. dimidiatus*.

8. *Chauliognathus faustus*.

Chauliognathus faustus, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 278, pl. 12, fig. 14 (♀).

♂. Aedeagus: apical portion of the median lobe produced into a long stout process; lateral lobes very elongate, subequal in length, the left lobe sinuate, blunt, and closely ciliate at the tip, and armed with a very minute tooth at the inner apical angle, the right lobe strongly sinuate, bowed inward at about the middle, and armed with a sharp claw towards the tip, the latter entire and somewhat pointed. Plate V, figs. 12, 12a.

Hab. PANAMA, Chiriqui.

This insect, at first sight, would appear to be nothing more than a form of *C. dimidiatus* (corresponding to the var. *nitidicollis* of *C. heros*) with entirely pale elytra and a rosy-red prothorax; but, as the lateral lobes of the aedeagus are differently shaped in the two males examined, *C. faustus* must be retained as a distinct species. The prothorax is transverse in both sexes (ten females and two males seen); but as it varies in shape in *C. heros*, no reliance could be placed on that character alone.

9. *Chauliognathus distinguendus*.

Chauliognathus distinguendus, Waterh., Trans. Ent. Soc. Lond. 1878, p. 328.

Chauliognathus tabulatus, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 70.

Hab. GUATEMALA; NICARAGUA; COSTA RICA.

Var. *a*. The elytra with the black discoidal subapical patch nearly reaching the outer margin, and coalescent anteriorly with the common scutellar mark, the outer limb to beyond the middle and the prothorax also (the large black patch on the disc excepted) sometimes rosy-red.

Chauliognathus tricolor, Gorh., loc. cit. p. 70, pl. 5, fig. 6 (♀).

Hab. NICARAGUA; COSTA RICA.

Var. β . Elytra black, with the outer limb narrowly or broadly to about the middle (the marginal stripes rarely connected by a narrow median fascia), and sometimes the apical margin also, flavous.

Chauliognathus jucundus, Gorh., loc. cit. p. 70, pl. 5, fig. 5 (♀).

Hab. MEXICO, Ventanas in Durango (*Höge*); GUATEMALA, San Gerónimo and Cubulco in Baja Vera Paz.

Var. γ . Elytra with a large, common, subcordate or subquadrate patch at the base (extending outwards to the humeri), and a very broad subapical fascia, black.

Hab. MEXICO, Acapulco and Chilpancingo in Guerrero (*Höge*, *H. H. Smith*).

Var. δ . Elytra as in γ , but with the broad subapical black patch extending to the apex.

Chauliognathus distinguendus, Gorh., loc. cit. p. 71 (*nec* Waterh.).

Hab. MEXICO, Huanchinango (*Truqui*), Oaxaca.

♂. Aedeagus: median lobe long, stout, curved, the apical portion obliquely produced and narrowed towards the tip; lateral lobes sinuate, the left lobe long, concave, somewhat dilated on the ventral aspect towards the apex, curved inward at the tip, the tip itself truncate and armed on each side with a short hook, the right lobe much shorter than the left, compressed, curved outward, and obtuse at the tip. Plate V, fig. 13.

The numerous specimens from Durango, Guerrero, Vera Paz, etc., show all the gradations between *C. distinguendus* and the forms named by Gorham: *C. tabulatus* differs in no way from the type; *C. tricolor* is based on freshly emerged examples with the outer limb of the elytra rosy-red; *C. jucundus* included a series from Vera Paz with the black portion of the elytra more extended than in *C. tricolor*, a similar series from Durango only differing from it in having the apical margin narrowly yellow; the forms γ and δ have a broad ochreous or flavous median fascia extending upwards at the sides to the shoulder. The bihamate apex of the left lateral lobe of the ♂-aedeagus

(which is similarly shaped in all the forms) is characteristic of the present species. This character at once separates *C. distinguendus* from similarly coloured examples of *C. limbicollis*, which, moreover, is a much smaller insect.

10. *Chauliognathus profundus*.

Chauliognathus profundus, Lec., Proc. Acad. Phil. 1858, p. 71 (*nec* Crotch, Horn, Gorham).

Chauliognathus togatus, var., Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 278 (1885).

Chauliognathus ineptus, Horn, Trans. Am. Ent. Soc. xii, p. 150 (1885).

Var. *α*. Elytra with a common transverse fascia, or a spot on the disc of each, at about the apical third, or a transverse scutellar patch at the base, black; the three transversely placed black spots on the disc of the prothorax sometimes united into a large patch.

Chauliognathus togatus, var., Waterh., Trans. Ent. Soc. Lond. 1878, p. 327.

Chauliognathus togatus, Gorh., loc. cit. pp. 71, 278, pl. 5, figs. 10, 11.

Var. *β*. Elytra wholly rufo-fulvous.

Chauliognathus togatus, type, Waterh., loc. cit. p. 326; Gorh., loc. cit. pp. 71, 278.

♂. Aedeagus: median lobe large, strongly curved, produced at the apex into a very broad spoon-shaped process; left lateral lobe long, broad, concave, subangularly dilated on the dorsal aspect towards the tip, the latter feebly hooked; right lateral lobe much shorter and narrower than the left, compressed, obliquely bent outward from about the middle, the tip rounded. Plate VI, figs. 15, 15a.

Hab. NORTH AMERICA, Arizona; MEXICO, Sonora, Chihuahua, Durango, Guanajuato, Michoacan, Morelos, Guerrero, Oaxaca.

Two species, each with about the apical third of the elytra black, were confused by Leconte under the name *C. profundus*—one, the type, from Sonora, with the head black, the other, from Arizona [described in Trans. Am. Ent. Soc. ix, p. 43 (1881)], with the head red. The first-mentioned is not rare on the table-lands of Mexico, but the typical form of it is scarce, two examples only (from

Chihuahua and Guanajuato respectively) having been seen by me. Höge has sent a long series of the other forms from Tacambaro, Michoacan. The prothorax has three transversely placed spots, or a trapezoidal patch, on the disc in all of them. The femora are sometimes red at the base.

11. *Chauliognathus lecontei*, n. sp.

Chauliognathus profundus, Crotch, Trans. Am. Ent. Soc. v, p. 78; Lec., Trans. Am. Ent. Soc. ix, p. 43 (*nec* Proc. Acad. Phil. 1858, p. 71); Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 278; Horn, Trans. Am. Ent. Soc. xii, p. 150.

Rufous, the palpi, two elongate streaks on the disc of the prothorax (sometimes reduced to two small spots or altogether wanting), the apex of the elytra broadly, the apex of the abdomen, and the legs (the base of the femora sometimes excepted) black, the antennae (as in *C. profundus*) usually with joints 3-11 in part testaceous, and for the rest black.

Length (excl. head) $12\frac{1}{2}$ -14 mm. (♂ ♀.)

♂. Aedeagus: median lobe stout, strongly curved, produced at the apex into a long spoon-shaped process; left lateral lobe long, abruptly angulate at about the middle, the basal portion oblong, spoon-shaped, the apical portion much narrower and strongly hooked at the tip; right lateral lobe much shorter than the left, compressed, obliquely bent outward from about the middle, the tip rounded. Plate V, figs. 14, 14a.

Hab. NORTH AMERICA, Arizona; MEXICO, Chihuahua.

The above description is taken from a long series sent by Höge from Chihuahua city and various examples received from Morrison as from Sonora. There is no variation in the colour of the elytra, but the two elongate streaks on the prothorax are sometimes reduced to small spots or are altogether wanting. *C. lecontei* is smaller and redder than *C. profundus*, the head is not black as in that species, and the abdomen (except the aedeagal cap of the male and the tip to a greater or less extent in the female) is almost wholly red. The aedeagus of the male does not differ greatly from that of its near ally. Mr. Wickham [Bull. Lab. Iowa, ii, p. 342, pl. 60, fig. 17 (1893)] has described the metamorphoses of the present insect at some length.

12. *Chauliognathus nigrocinctus*.

Chauliognathus nigrocinctus, Gorb., Biol. Centr.-Am., Coleopt. iii, 2, p. 72, pl. 5, fig. 12 (♂).

Var. *α*. The common black post-median fascia of the elytra reduced to a rounded spot on the disc of each.

Chauliognathus distinguendus, var. ?, Waterh., Trans. Ent. Soc. Lond. 1878, p. 328.

Chauliognathus signatus, Gorb., loc. cit. p. 72 (♀).

Var. *β*. The black basal fascia of the elytra wanting, the post-median fascia reduced to a transverse streak on the disc of each; the prothorax immaculate; the head flavous at the sides in front. (♀.)

Chauliognathus bilineatus, var. 2, Gorb., loc. cit. p. 279.

♂. Aedeagus: median lobe moderately curved, the apical portion short; left lateral lobe very long, concave, compressed and dilated at the base, the long apical portion curved, hooked at the tip; right lateral lobe short, compressed at the base, and obliquely directed outward from about the middle. Plate VI, fig. 16.

Hab. MEXICO, Chihuahua, Durango, Guanajuato, Jalisco, Guerrero, Oaxaca.

A common insect in Mexico and sent in abundance by Höge from Sayula in Jalisco and by H. H. Smith from Rincon in Guerrero. There is not the slightest ground for treating *C. nigrocinctus* and *C. signatus* as separate species. *C. nigrocinctus* is smaller and less elongate than *C. profundus* (= *togatus*, Waterh.), ochreous or flavous above, the black head excepted; the prothorax with from 2-5 transversely placed spots on the disc, which are often united into a transverse fascia; the elytra with a narrow complete basal fascia, and a transverse fascia of variable width beyond the middle, which is reduced to a rounded spot on the disc of each in the var. *signatus*, black; the legs, antennae, and abdomen in great part, black, the anterior tibiae sometimes testaceous along their inner edge. The differently shaped lateral lobes of the aedeagus separate *C. nigrocinctus* from all the varieties of *C. distinguendus*, which, moreover, never has a common narrow black basal fascia to the elytra. The var. *β* is represented by a single female from Pinos Altos in Chihuahua.

13. *Chauliognathus bilineatus*.

Chauliognathus bilineatus, Gorb., Biol. Centr.-Am., Coleopt. TRANS. ENT. SOC. LOND. 1914.—PART I. (JUNE) L

iii, 2, pp. 72, 279, pl. 5, fig. 13 (♀) (exclud. the var. from Chihuahua).

Hab. MEXICO, precise locality unknown.

Var. *a.* Elytra with the apical third black.

Chauliognathus bilineatus, var. 1, Gorh., loc. cit. p. 279, pl. 12, fig. 16 (♂).

Hab. MEXICO, Coahuila and Nuevo Leon.

♂. Aedeagus: median lobe strongly curved, the apical portion produced; left lateral lobe short, sinuate, stout, widened at the base, narrowing outwards, hooked at the tip; right lateral lobe much shorter than the left, compressed, bowed outward from about the middle. Plate VI, fig. 17.

The type form described by Gorham is ochreous, the head transversely marked with black between the eyes and at the base, the prothorax with two long narrow black streaks on the disc, the elytra with or without a small black spot on the disc beyond the middle, the femora broadly testaceous at the base, the rest of the legs and the antennae black, the ventral segments sometimes spotted with black. The variety from Saltillo in Coahuila and Monterey in Nuevo Leon, with broad black apex to the elytra, and the prothorax bilineate or immaculate, comes near *C. lecontei*.

14. *Chauliognathus collaris*.

Chauliognathus collaris, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 76 (♂).

♂. Aedeagus: median lobe long, broad, obliquely bent, produced at the apex; left lateral lobe stout, concave, very abruptly bent from near the base, the long apical portion strongly curved, narrowing outwards, and hooked at the tip; right lateral lobe much shorter than the left, stout, compressed, pointed at the tip. Plate VI, figs. 18, 18*a*.

Hab. MEXICO, Oaxaca (*Sallé, Boucard*).

Var. ? Elytra ochraceous, with a common transverse patch at the base black; the abdomen wholly black.

Hab. MEXICO (*Mus. Oxon.*: ♀).

Described by Gorham from a single specimen incorrectly stated to be from Cordova. The type (♂) is labelled

“Oaxaca,” and there are three females in the “Biologia” collection from the same source. *C. collaris* is larger than *C. aterrimus*, differing from the similarly coloured form of that species in having the prothorax rounded at the sides posteriorly, very shining, and nigro-bipunctate on the disc; the antennae extremely elongate, and the eyes more prominent, in the male; and the abdominal segments very narrowly bordered externally with yellow. The aedeagus is very similarly shaped in the two insects, that of *C. collaris* having a much longer median lobe and the longer lateral lobe more strongly curved from the abruptly twisted basal portion. The single (♀) specimen with pallid elytra (a transverse patch at the base excepted) seems to belong to the same species.

15. *Chauliognathus vestitus*, n. sp.

Black, the abdomen ochreous spotted with black; thickly, the head and prothorax sparsely, clothed with rather long cinereous pubescence, the elytra dull, the rest of the upper surface shining. Head in ♂ triangular and with large prominent eyes, smaller in ♀; antennae long, filiform, joint 3 a little more than half the length of 4. Prothorax subquadrate in ♂, broader and transverse in ♀, strongly rounded at the sides anteriorly and with rather prominent hind angles, the margins broadly reflexed, especially in ♀; the surface uneven, very shining, and almost smooth, the disc foveate in the middle towards the base. Elytra long, broader than the prothorax, gradually narrowed from about the basal fourth.

♂. Aedeagus: median lobe long, curved, produced into a spoon-shaped process at the apex; left lateral lobe extremely elongate, sinuate within, and produced at the apex into a long curved hook; right lateral lobe much shorter than the left, compressed, rounded at the apex. Plate VI, fig. 19.

Length (excl. head) 10–10½ mm. (♂ ♀.)

Hab. MEXICO (*Mus. Oxon.*), Oaxaca (*Boucard*).

One pair, left undetermined by Gorham, and three others (♂ ♀) in the Oxford Museum. A wholly black form, the abdomen excepted, with a very shining, almost smooth prothorax, and rather coarse cinereous pubescence, which is sufficiently dense on the elytra to give them a grey appearance. The structure of the aedeagus, too, is characteristic. *C. vestitus* may be placed near *C. collaris*, the four known specimens of which were obtained by Boucard at the same locality.

16. *Chauliognathus aterrimus*.

Chauliognathus aterrimus, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 76 (♂).

Var. *a*. Prothorax rufous or flavous, rarely with various coalescent marks on the disc, or two sinuous vittae and an oblong mark between them, or three small transversely placed spots, black.

Chauliognathus sp. ? (no. 25a), Gorh., loc. cit. p. 282 (♀).

♂. Aedeagus : median lobe obliquely bent, produced into a rather long, broad, somewhat curved, spoon-shaped process at the apex; left lateral lobe moderately stout, concave, broad at the base, abruptly bowed before the middle, and with the longer apical portion curved and feebly hooked at the tip; right lateral lobe much shorter than the left, rather broad, compressed, pointed at the tip. Plate VI, figs. 20, 20a.

Hab. MEXICO (*Truqui*), Puebla (*Sallé* : types), Cuernavaca in Morelos, Matamoros Izucar in Puebla (*Höge*), Venta de Zopilote in Guerrero (*H. H. Smith*).

The two insects seen by Gorham were both from Puebla, but he does not seem to have suspected their affinity, as the female with a red prothorax was compared by him with *C. collaris*, a very different insect. Amongst the series of twenty-five examples now available for examination, most of which are from Cuernavaca, five only have the prothorax black, and in one of these there are two small transverse red marks on the anterior part of the disc. This species has the entire upper surface opaque; the head rather small, the eyes somewhat prominent; the antennae long and slender in the male, shorter in the female; the prothorax subquadrate, with rather prominent hind angles and broadly reflexed margins; the body (the flavescent lateral margins of the abdomen excepted), antennae, and legs black, the prothorax often wholly, or in part, rufous. A male of each form has been dissected. The single example (♀) from Guerrero is larger and more elongate than the rest. In one of the two males in the Oxford Museum the prothorax is red, with various coalescent black markings on the disc, such as in *C. hieroglyphicus*.

17. *Chauliognathus exiguus*. (Plate III, fig. 8, ♂.)

Chauliognathus exiguus, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 283.

♂. Aedeagus: median lobe very stout, abruptly curved, slightly produced at the apex; left lateral lobe very slender, long, sinuate, dilated at the base, feebly hooked at the tip; right lateral lobe short, compressed, slightly hooked at the tip. Plate VI, fig. 21.

Hab. PANAMA, Chiriqui; COLOMBIA, Santa Marta (*Mus. Brit.*).

Described from three specimens, one, from Bugaba, having the prothorax immaculate, as in a Colombian example (♀) in the British Museum. The pair retained for the "Biologia" collection are very similar, the female simply being broader than the male, and the rather short, stout, filiform antennae do not reach the middle of the elytra in either sex, tapering a little towards the apex in the female. The elytra are parallel and have their sutural and outer margins flavous. The prothorax has two prominent callosities on the disc, separated by a deep groove. *C. exiguus* is one of the smallest known species of the genus.

18. *Chauliognathus limbicollis*. (Plate III, fig. 9, ♂, var. *scapularis*.)

Chauliognathus limbicollis, Lec., Proc. Acad. Phil. 1858 [1859], p. 71; Trans. Am. Ent. Soc. ix, p. 44; Crotch. Trans. Am. Ent. Soc. v, p. 78; Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 283.

Chauliognathus opacus, Lec., New Sp. N.-Am. Col. p. 90 (1865).

Chauliognathus hastatus, Gorh., loc. cit. p. 77, pl. 5, fig. 7 (♀).

Hab. NORTH AMERICA, Southern United States; MEXICO; GUATEMALA.

Var. *a*. Prothorax opaque, wholly black; elytra with the apical black space extending broadly forward along the suture to the base, and usually widening anteriorly, leaving the sides to beyond the middle to a greater or less extent, and the apical margin, yellow. (♂ ♀.)

Hab. MEXICO (*Mus. Brit., ex coll. Pascoe*), Morelia in Michoacan (*Höge*).

Var. *β*. Prothorax shining, ochreous or rufo-testaceous, with two or three transversely placed spots on the disc, which are sometimes confluent, black; elytra black, with a humeral patch or stripe (sometimes reaching to about the middle), and the apical margin

rarely, ochreous; apices of the femora, the anterior and intermediate tibiae in great part, and the base of the posterior tibiae, testaceous. (♂ ♀.)

Chauliognathus scapularis, Gorh., loc. cit. p. 77 (♀).

Hab. MEXICO (*ex coll. Sturm; Truqui*), Zapotlan in Colima, Chilpancingo in Guerrero (*Höge*).

♂. Aedeagus: median lobe long, obliquely bent; left lateral lobe long, broad and concave to about the middle, and then abruptly narrowed and arcuately bowed to the tip (the apical portion varying in length and breadth in the ten specimens dissected), the tip more or less hooked; right lateral lobe much shorter than the left, compressed, obliquely bent. Plate VI, figs. 22, 22a.

An abundant insect in Mexico and varying greatly in colour, *C. limbicollis* itself being probably yet another form of *C. pennsylvanicus*, De Geer; but amongst the very large number of specimens before me there are none from Mexico or Guatemala with the elytra marked as in typical examples of the latter, *i. e.* with an oblong subapical black spot or vitta on the disc. *C. scapularis* has been received from the same localities (Zapotlan and Chilpancingo) as *C. limbicollis* (the latter sometimes having the knees broadly testaceous), and cannot be separated from it. The variety *α*, with wholly black prothorax, is represented by a series of nine specimens from Morelia. Leconte's type of *C. limbicollis* has a triangular scutellar patch and the apex of the elytra broadly black (this form being not uncommon at Orizaba), the dark markings being usually broadly coalescent along the suture in the Central American material examined. The aedeagus varies in the development of the curved apical portion of the longer lobe, but the general structure is similar. The antennae of the male are very long, distinctly widened outwards, with the apical joint a little narrower than the preceding; but in one Mexican example of this sex (apparently belonging to the same species) they are slender throughout.

19. *Chauliognathus mundus*, n. sp.

Chauliognathus scutellaris, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 283 (*nec Lec.*) (the Mexican examples from the Sallé collection only).

Chauliognathus mundus, Chevr. in litt.

Opaque, black; the prothorax rufo-testaceous, sometimes with a transverse or M-shaped black mark on the disc; the elytra ochre-

ous, with a black discoidal vitta extending from a little below the base to near the tip, the base sometimes transversely fuscous on either side of the scutellum; abdomen ochreous, the apical segment and aedeagal cap more or less infuscate; anterior and intermediate tibiae testaceous. Head moderately large, the eyes not prominent; antennae very elongate in ♂, shorter in ♀, tapering slightly at tip, joint 3 about half as long as 4. Prothorax large, broader than long, in ♀ almost as wide as the elytra, rounded at each angle, the margins rather broadly reflexed. Elytra subulate.

♂. Aedeagus: median lobe obliquely bent; left lateral lobe long, concave, angularly dilated at about the middle, the apical portion abruptly curved, acuminate, hooked at the tip; right lateral lobe much shorter than the left, twisted and angularly dilated inwards near the base, the apical portion curved and compressed, blunt at the tip. Plate VII, figs. 23, 23a.

Length (excl. head) 9½–10 mm. (♂ ♀.)

Hab. MEXICO (*Mus. Brit.*), Orizaba in Vera Cruz (*Sallé*).

Three males and two females, apparently distinct from the similarly coloured northern *C. pennsylvanicus*, De Geer*; differing from it in the relatively larger prothorax (especially noticeable in ♀), and the more subulate elytra. From similarly coloured varieties of *C. scutellaris* the broader and more transverse prothorax will serve to distinguish *C. mundus*. The aedeagus exhibits the same general structure in all these nearly related forms.

20. *Chauliognathus scutellaris*.

Chauliognathus scutellaris, Lec., Proc. Acad. Phil. vi, p. 230 (1853); Trans. Am. Ent. Soc. ix, p. 44 (1881); Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 283 (part.).

Chauliognathus basalis, Lec., Col. of Kansas and E. New Mexico, p. 13; Trans. Am. Ent. Soc. ix, p. 44.

Chauliognathus lewisii, Crotch, Trans. Am. Ent. Soc. v, p. 78 (1874).

♂. Aedeagus: median lobe obliquely bent; left lateral lobe long, angularly dilated at about the middle, and abruptly and arcuately bowed thence to the apex, the basal portion stout, the apical portion much narrower and hooked at the tip; right lateral lobe about as long as the basal portion of the left lobe, compressed, and obliquely bent. Plate VII, fig. 24.

Hab. NORTH AMERICA, Kansas, Texas, New Mexico, etc.; MEXICO, Monclova in Coahuila (*Dr. Palmer*), Saltillo in

* The life history of this species has been fully described by Riley.

Coahuila, Villa Lerdo and San Isidro in Durango, Monterey in Nuevo Leon (*Höge*).

The series of fifty specimens (varying from $7\frac{1}{2}$ – $10\frac{1}{2}$ mm. in length, exclusive of the head) sent by Höge from Northern Mexico connect the various forms of this species, which is separable from *C. limbicollis* by the more shining prothorax and base of the elytra; the anteriorly narrowed, less transverse prothorax (at least in ♂), and the more subulate elytra. The black patch on the prothorax varies in extent, and is sometimes wanting; and the elongate discoidal subapical streak on the elytra is often united to the triangular scutellar mark (the suture remaining yellow), the latter becoming gradually shorter and shorter (*C. lewisii*) as the streak extends forwards till at last they are united into a continuous stripe. Three males have been dissected, including one from Kansas, and the aedeagus proves to be formed very much as in *C. limbicollis* and *C. pennsylvanicus*. *C. vittatus*, Schaeffer, from Nogales, Arizona, must be very closely related to the present species.

21. *Chauliognathus discus*.

Chauliognathus discus, Lec., Proc. Acad. Phil. vi, p. 230 (1853); Trans. Am. Ent. Soc. ix, p. 44 (1881); Crotch, Trans. Am. Ent. Soc. v, p. 78.

? *Chauliognathus misellus*, Horn, Trans. Am. Ent. Soc. xii, p. 150 (1885).

Ochreous, the head between and behind the eyes, and sometimes along the middle anteriorly, the antennae, two or three transversely placed spots on the disc of the prothorax, often united into a common fascia or dilated into an M-shaped mark, a small transverse patch at the base of each elytron and a large spot on the disc at about one-third from the apex, black; the femora with the basal half or more testaceous and the rest of the legs black; beneath pale flavous, the metasternum and ventral segments nigro-fasciate in ♀, the aedeagal cap slightly infuscate in ♂. Head rather long, the eyes somewhat prominent; antennae slender, fully as long as the body and perceptibly thickened towards the apex in ♂ (joints 3–8 slender and 9–11 a little wider), shorter and filiform in ♀, joint 3 about half the length of 4 in ♂. Prothorax shining, broader than long, rounded-subquadrate, the margins broadly reflexed, the disc with an oblong sulciform impression in the middle. Elytra much wider than the prothorax, gradually narrowing posteriorly, rather coarsely punctate, and often obsolete costate on the disc, shining at the base.

♂. Aedeagus: median lobe obliquely curved, produced at the apex; left lateral lobe stout, long, concave, compressed and sub-angularly dilated at about the middle, hooked at the tip; right lateral lobe much shorter than the left, compressed, somewhat spoon-shaped at the apex. Plate VII, figs. 25, 25a.

Length (excl. head) $9\frac{1}{2}$ –12 mm. (♂ ♀.)

Hab. NORTH AMERICA, Texas, Arizona; MEXICO (*Mus. Brit., ex coll. Fry*), Villa Lerdo in Durango (*Höge*).

The fifteen specimens from Durango from which the above description is taken vary in the development of the markings on the prothorax and in the size of the discoidal spot on each elytron; but they all have the base of the femora to a greater or less extent testaceous, whereas the N. American forms are said to have the legs black. This character, however, is scarcely of specific value, and in the absence of material from north of the Mexican frontier for comparison the Durango insect is best treated as a form of *C. discus*, of which *C. misellus* would appear to be a variety. Leconte first gave "Mexican boundary" as locality, later (and apparently from other specimens) substituting "Texas." Horn's *C. misellus* was from Arizona.

22. *Chauliognathus marginatus*.

Cantharis marginata, Fabr. Syst. Ent. p. 206.

Chauliognathus marginatus, Hentz, Trans. Am. Phil. Soc., n. ser., iii, p. 460; Lec., Proc. Acad. Phil. v, p. 388 (1851); Trans. Am. Ent. Soc. ix, p. 44; Crotch, Trans. Am. Ent. Soc. v, p. 78.

Cantharis ligata, Say, Journ. Acad. Phil. v, p. 166.

Chauliognathus hentzii, Lec., loc. cit.

♂. Aedeagus: median lobe obliquely bent; left lateral lobe extremely elongate, strongly sinuate, acuminate and hooked at the tip; right lateral lobe short, compressed, obliquely bent and hooked at the apex. Plate VII, fig. 26.

Hab. NORTH AMERICA, New York to Florida; MEXICO, Monterey in Nuevo Leon (*Höge*).

This common N.-American insect is now known to extend into Mexico. It has a broad V-shaped mark on the head, a broad median vitta on the prothorax, and a discoidal vitta on each elytron (sometimes reduced to an oblong subapical spot), black, the rest of the upper surface being testaceous

or rufo-testaceous; the femora are broadly testaceous at the base; the antennae are moderately long, tapering outwards in both sexes; and the prothorax is oblong subquadrate, with narrowly reflexed margins, the surface opaque. The allied *C. obscurus*, Schaeffer, from Nogales, Arizona, is stated to have a longer third antennal joint, and the elytra, except basal part of margin and anterior part of suture, black.

23. *Chauliognathus sulphureus*.

Chauliognathus sulphureus, Waterh., Trans. Ent. Soc. Lond. 1878, p. 331 (♀).

Chauliognathus pallidus, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, pp. 73, 279 (*nec* Waterh.).

♂. Aedeagus: median lobe strongly bowed, the apical portion obliquely produced; left lateral lobe long, rather convex, feebly sinuate within, hooked at the tip; right lateral lobe much shorter than the left, compressed, the apical portion somewhat spoon-shaped. Plate VII, figs. 27, 27a.

Hab. MEXICO, Vera Cruz; GUATEMALA; NICARAGUA; PANAMA; AMAZONS.

The type of this insect is an immature discoloured female, from Nauta, in the Amazon valley; but there can be no doubt as to the identification of the species. *C. sulphureus* may be readily distinguished from *C. pallidus*, Waterh., by its larger size, the uniformly sulphur-yellow or ochreous upper and under surfaces, the black antennae and legs, and the dark wings; the somewhat attenuate elytra do not quite cover the abdomen or wings (this being especially noticeable in the female), the eyes are relatively smaller and less prominent in the male, and the lateral lobes of the aedeagus are very differently shaped.

24. *Chauliognathus pallidus*.

Chauliognathus pallidus, Waterh., Trans. Ent. Soc. Lond. 1878, p. 330 (♂) (*nec* Gorh.).

Chauliognathus oedemeroides, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, pp. 73, 279.

Chauliognathus fuscescens, Gorh., loc. cit. p. 73.

Hab. MEXICO, Vera Cruz; BRITISH HONDURAS; GUATEMALA; NICARAGUA; COSTA RICA; PANAMA; COLOMBIA (*Mus. Brit.*), etc.

Var. α . The base of the head, a patch on the disc of the prothorax, the elytra (the sutural, apical, and lateral margins excepted), the outer half of the femora, the antennae, tibiae, and tarsi infusate. ($\text{\textcircled{f}}$.)

Hab. MEXICO, Teapa.

$\text{\textcircled{m}}$. Aedeagus: median lobe stout, curved, moderately produced at the apex; left lateral lobe short, broad, compressed, subtruncate at the tip, and armed with a sharp tooth at the upper apical angle; right lateral lobe (fig. 28a) much longer than the left, the outer portion widened and oblique, the apex sharply hooked at the inner angle and toothed at the outer angle. Plate VII, figs. 28, 28a.

An immature-looking, elongate insect, testaceous in colour, with the antennae, knees, and tarsi, and sometimes the extreme base of the elytra also (*C. oedemeroides*), infusate or black. The wings are slightly infusate. The eyes are very large and prominent in the male, a little smaller in the female. The variety is represented by a single female from Teapa. A common insect in Central America, represented by 70 examples in the collections before me. Five males have been dissected, showing no variation in the form of the lateral lobes of the aedeagus: the tooth at the apex of the broadly expanded left lobe (not shown in the figure) can only be seen when the aedeagus is viewed in profile.

25. *Chauliognathus exsanguis*. (Plate III, fig. 10, $\text{\textcircled{m}}$, var.)

Chauliognathus exsanguis, Gorb., Biol. Centr.-Am., Coleopt. iii, 2, p. 74 (part.) (*nec* p. 279).

Opaque, testaceous, the antennae, the apices of the femora, the tibiae and tarsi, some markings at the base of the head, an oblong patch on the disc of the prothorax (sometimes divided down the middle, or altogether wanting), and rarely a posteriorly evanescent streak on the basal half of each elytron near the suture; more or less infusate. Head faintly punctulate, in $\text{\textcircled{m}}$ much narrowed behind and with very prominent eyes, smaller in $\text{\textcircled{f}}$; antennae in $\text{\textcircled{m}}$ reaching to a little beyond the middle of the elytra, shorter in $\text{\textcircled{f}}$, joint 3 about twice as long as 2. Prothorax narrow, oblong, slightly sinuate at the sides posteriorly, broader in $\text{\textcircled{f}}$, the margins feebly reflexed. Elytra incompletely covering the abdomen, narrowed posteriorly. Aedeagal cap of $\text{\textcircled{m}}$ very elongate.

Var. α . The head between and behind the eyes, entirely or in

part, a broad median vitta or two streaks on the disc of the prothorax, the elytra (the inner, apical, and outer margins excepted), and the legs in great part, infusate or black.

♂. Aedeagus: median lobe strongly curved, produced into a thin spoon-shaped lamella at the tip; left lateral lobe rather convex, very long, slender, sinuate, slightly hooked at the tip; right lateral lobe a little more than half the length of the left, curved and feebly hooked at the apex. Plate VII, fig. 29.

Length (excl. head) $5\frac{1}{4}$ – $9\frac{1}{4}$ mm. (♂ ♀.)

Hab. MEXICO, Tuxtla (*Sallé*), Teapa (*H. H. Smith*); GUATEMALA, Lanquin [type], San Juan, and Panzos in Alta Vera Paz (*Champion*); NICARAGUA, Chontales (*Belt*).

The pair labelled by Gorham as the types are immature and almost immaculate, and the name *exsanguis*, therefore, is misleading. A series from Teapa includes all the above-mentioned forms. The present species is very closely related to *C. lituratus* (= *emaciatius*), Gorh., from which it mainly differs in its more prominent eyes in both sexes, and the narrower body. The aedeagus is very similarly formed in the two species, and is different in structure from that of the other forms (one of which is also from Alta Vera Paz) included by Gorham under *C. exsanguis*. The single dark male from Panzos has stouter antennae, and the left lateral lobe of the aedeagus shorter and more sinuate, and it may therefore belong to yet another species? An immature pallid male from Chontales has the sides of the prothorax deeply sinuate. Eight males have been dissected, the figure of the aedeagus being taken from the Lanquin type.

26. *Chauliognathus decolor*, n. sp.

Chauliognathus exsanguis, and var., Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 279 (*nec p. 74*).

Pale testaceous, the antennae (except the basal joint in some examples) and a fine line along the base and outer margin of the elytra (wanting in immature specimens) fuscous, the elytra often becoming more or less infusate to near the apex and with the tip yellowish (the variety described by Gorham), the eyes black; finely pubescent, shining, the elytra duller towards the apex. Head much narrowed behind, the eyes prominent; antennae very long and slender, nearly reaching the tip of the elytra in ♂, shorter in ♀, joint 3 nearly three times as long as 2. Prothorax narrow, longer than broad, wider in ♀, more or less sulcate down the middle and

with the margins moderately reflexed. Elytra long, incompletely covering the abdomen in ♀, somewhat attenuate posteriorly.

♂. Aedeagus: median lobe stout, curved, obliquely cut off at tip; left lateral lobe long, slender, abruptly and arcuately twisted from about the middle, and blunt at the apex; right lateral lobe broader than the left, compressed, moderately long, armed with a rather long, curved, ciliate, tooth-like prominence at the base, and feebly bidentate at tip. Plate VII, fig. 30.

Length (excl. head) $6\frac{1}{2}$ –10 mm. (♂ ♀.)

Hab. PANAMA, Bugaba, Tolé, Los Remedios (*Champion*).

Seven females and two males, the latter immature. This is the insect referred by Gorham in his "Supplement" to *C. exsanguis*, under which he originally included two Guatemalan forms. The present species is closely related to *C. submarginatus* (the male having a very similarly formed aedeagus), from which it may be distinguished by the longer second antennal joint, the immaculate shining prothorax, etc. The antennae are longer than in *C. exsanguis*.

27. *Chauliognathus evanidus*, n. sp.

Chauliognathus exsanguis, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 74 (part.) (*nec* p. 279).

Opaque, testaceous, the antennae, and in one specimen the knees and tarsi also, infuscate. Head much narrowed behind, the eyes large and prominent; antennae very long and slender, joint 3 about three times the length of 2. Prothorax rounded-subquadrate, narrower in ♂ than in ♀. Elytra elongate, nearly covering the abdomen.

♂. Aedeagus: median lobe very stout, not produced at the apex; left lateral lobe moderately long, compressed, blunt at the tip, with a strongly curved, long, stout hook abruptly projecting from the inner edge at some distance before the apex; right lateral lobe* about as long as the left, broad at the base, the longer apical portion becoming abruptly narrower and compressed, feebly bidentate at the tip. Plate VII, fig. 31.

Length (excl. head) 8–10½ mm. (♂ ♀.)

Hab. GUATEMALA, Panima [♂], Panzos [♀] (*Champion*).

One pair. This insect is very like *C. decolor*, but has longer elytra, a broader head and prothorax (especially noticeable in ♂), and a differently formed aedeagus, the left lateral lobe bearing a twisted, projecting, hook-like

* Accidentally broken off after the description was written.

process towards the tip. This last-mentioned structure separates *C. evanidus* from *C. exsanguis*, etc.

28. *Chauliognathus lituratus*.

Chauliognathus lituratus, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, pp. 74, 280.

Hab. MEXICO, Vera Cruz, Oaxaca; GUATEMALA; NICARAGUA; PANAMA.

Var. α . The black horseshoe-shaped patch on the disc of the prothorax more extended; the elytra testaceous or fuscous. (σ \textasciitilde \textasciitilde).

*Chauliognathus emaciatu*s, Gorh., loc. cit. p. 75, pl. 5, fig. 17 (\textasciitilde).

Hab. GUATEMALA.

Var. β . The elytra almost entirely infuscate, the prothoracic marking obsolete. (\textasciitilde).

Hab. MEXICO, Tabasco; GUATEMALA.

Var. γ . The head rufescent or testaceous, nigro-bivittate at the base; the prothorax with an oblong black patch on the disc; the elytra pale. (\textasciitilde).

Hab. MEXICO, Jalapa.

σ . Aedeagus: median lobe long, obliquely bent, spoon-shaped at the tip; left lateral lobe extremely elongate, more or less sinuate, feebly hooked at the apex; right lateral lobe one-half or one-third shorter than the left, twisted, compressed, distinctly hooked at the tip. Plate VIII, figs. 33, 33a.

A very variable insect, and not uncommon in Southern Mexico and Guatemala. In the form described by Gorham as *C. lituratus* the elytra, which do not completely cover the abdomen, are testaceous or yellow, and often have the whole of the disc (the sutural and lateral margins excepted) infuscate, and the prothorax has a horseshoe-shaped black patch (sometimes divided into two spots) on the disc. The head usually has the basal half almost entirely black; it is gradually narrowed behind, and is large and elongate in the male, but the eyes are not prominent in either sex. Four males have been dissected, showing little variation. The structure of aedeagus is extremely like that of *C. exsanguis*.

29. *Chauliognathus pardalinus*. (Plate III, fig. 11, ♂.)

Chauliognathus pardalinus, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 280.

♂. Aedeagus : median lobe obliquely bent, produced into a spoon-like process at the apex ; left lateral lobe extremely elongate, slender, sinuate, slightly hooked at the tip ; right lateral lobe about one-third shorter than the left, curved and acuminate at the apex. Plate VII, fig. 32.

Hab. PANAMA, Bugaba.

Gorham's description of this species was taken from the unique male, which has an enormously developed, elongate head and abbreviated lanciform elytra, the head being comparatively small and the elytra much more elongate in the female, both sexes having four spots on the head and an M-shaped mark on the prothorax black. The eyes are not prominent. The aedeagus is formed much as in *C. lituratus* and its allies. In immature examples the black markings are obsolete.

30. *Chauliognathus submarginatus*.

Chauliognathus submarginatus, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 279, pl. 6, fig. 16 (♀).

♂. Aedeagus : median lobe short, curved, stout, not produced at the apex ; left lateral lobe long, slender, abruptly and arcuately twisted from about the middle, the apical portion oval ; right lateral lobe a little shorter than the left, strongly bowed, angularly dilated towards the base within, and armed with a small tooth at the tip. Plate VIII, fig. 34.

Hab. NICARAGUA, Chontales ; PANAMA, Chiriqui.

A close ally of *C. decolor* (= *exsanguis*, Gorh., part.), with some markings on the base of head, two lines or vittae on the prothorax, a small humeral spot or a faint marginal line on the elytra, the apices of the femora, the tibiae, tarsi, palpi, and antennae fuscous. The head of the male is considerably elongated behind and less constricted at the base than in the same sex of *C. decolor*. The third antennal joint is only about twice as long as the second.

31. *Chauliognathus sticticus*.

Chauliognathus sticticus, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 280.

♂. Aedeagus: median lobe obliquely bent, rounded at the tip, and with a curved spoon-shaped projection on the ventral aspect at the base; left lateral lobe short, compressed, obliquely truncate and pointed at the tip, the apex feebly toothed at the upper angle; right lateral lobe a little longer than the left, compressed, curved, produced at the apex into a stout curved hook, and angularly dilated externally before the tip. Plate VIII, figs. 35, 35a.

Hab. NICARAGUA, Granada and Chontales; PANAMA, Chiriqui.

A long series, showing very little variation in colour. The head has a V-shaped mark towards the base, and the prothorax three transversely arranged spots across the middle of the disc (often united into an undulate fascia), infuscate or black, and the elytra are uniformly dilute fuscous, like the antennae and knees. The median prothoracic sulcus is deep. Gorham omitted to notice the Nicaraguan habitat, though he labelled a specimen from that country, *C. sticticus*. The form of the aedeagus is characteristic, the median lobe having a spatuliform projection at the base beneath (not visible in our figures), and the lateral lobes are peculiarly formed.

32. *Chauliognathus sagittarius*.

Chauliognathus sagittarius, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 280 (♀).

Hab. PANAMA, Volcan de Chiriqui.

Described from three females, the male being still unknown. Very like *C. submarginatus*, but with the third antennal joint relatively shorter, it being only a little longer than the second. The head is small, and the eyes prominent; the prothorax is opaque, and has a sagittiform black streak on the disc; the fuscous marginal line on the elytra does not extend to the base or apex; the palpi, antennae, knees, tibiae, and tarsi are infuscate or black.

33. *Chauliognathus hieroglyphicus*. (Plate III, fig. 12, ♂.)

Chauliognathus hieroglyphicus, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 282.

Hab. MEXICO, Guanajuato (*Sallé* and *Dugès*: types), Tonila and Zapotlan in Colima, Lagos in Aguas Calientes and Sayula in Jalisco (*Höge*).

Var. *a.* Nigro-piceous, the prothorax sometimes in part yellow, leaving the black spots sharply defined. (♂ ♀.)

Hab. MEXICO, Tonila and Zapotlan.

♂. Aedeagus: median lobe obliquely bent; left lateral lobe long, strongly sinuate, thickened in its basal half, hooked at the tip; right lateral lobe much shorter than the left, compressed, pointed at the tip. Plate VIII, figs. 36, 36*a*.

Höge has sent us a long series of this species, including various varieties, the insect having been described from a few specimens from Guanajuato. In the type-form the numerous black hieroglyphic markings on the prothorax are sharply defined, these gradually becoming more and more extended till the margins only remain yellow; the elytra have each a narrow transverse mark or spot at the base (frequently wanting), and often a rounded spot on the disc beyond the middle, black; and the legs vary in colour from almost wholly testaceous to black. The dark variety is represented by seven examples. A very distinct species, and recognisable by its shining surface and peculiar prothoracic markings, which are usually traceable in the dark form. *C. scriptus* (Germ.), from Argentina, is not unlike *C. hieroglyphicus*, but it has stouter posterior femora in the male.

34. *Chauliognathus terminalis*.

Chauliognathus terminalis, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 76.

♂. Aedeagus: median lobe obliquely bent, produced at the apex; left lateral lobe extremely elongate, slender, curved (as seen in profile), feebly hooked at the tip; right lateral lobe a little shorter and much stouter than the left, sinuous, angularly dilated on each side at the apex, and armed with a broad, acutely pointed, hook-like process before the tip above (the apex appearing trifurcate when viewed from in front). Plate VIII, fig. 37.

Hab. NICARAGUA; COSTA RICA.

Gorham's description of this species was taken from three specimens in bad condition. Three others have since been received, found by Pittier, at San Carlos, Costa Rica. *C. terminalis* may be known by its opaque surface, long head, with prominent eyes in the male, very slender antennae, long, subquadrate prothorax, subulate elytra,

black legs, and the black and ochreous general coloration, the ochreous colour sometimes confined to the basal half of the elytra and a portion of the under surface (the apical half of the abdomen being always black) and sometimes extending to the prothorax and to near the apex of the elytra. The aedeagus has been dissected in the two males available, and it exhibits a remarkable development of both the lateral lobes.

35. *Chauliognathus dispar*, n. sp.

Callianthia dispar, Sturm in litt. (♀).

♂. Head, antennae, prothorax, scutellum and legs black, the head with some markings in front, and the prothoracic margins narrowly (completely or incompletely) yellow, the femora sometimes testaceous at the base; the elytra varying in colour from piceous to obscure testaceous, often with an oblique testaceous streak extending from the humeri downwards, the sutural and outer margins and scutellum rarely flavous; beneath in great part ochreous; thickly clothed with fine cinereous pubescence, the prothorax shining and more sparsely pubescent. Head large, broad, subtriangular, the eyes not prominent; antennae long, filiform, joint 3 much shorter than 4. Prothorax rounded-subquadrate, bicarinate on the middle of the disc, and with a short deep oblong groove in the centre. Elytra much wider than the prothorax, strongly subulate.

♀. Head shorter, sometimes wholly testaceous anteriorly, the antennae less elongate; prothorax rufo-testaceous, margined on all sides with yellow, transverse, rounded at the sides; elytra varying in colour from black to fusco-testaceous, usually with a long, oblique, conspicuous, testaceous streak extending downwards from the shoulder, the sutural and outer margins sometimes flavescens; femora sometimes wholly testaceous; ventral segments often broadly nigro-fasciate.

♂. Aedeagus: median lobe obliquely bent; left lateral lobe moderately long, sinuate, subangulate near the base, hooked at the tip; right lateral lobe a little shorter than the left, somewhat acuminate at the apex. Plate VIII, figs. 38, 38a.

Length (excl. head) 7-9 mm. (♂ ♀.)

Hab. MEXICO (*Truqui*, in *Mus. Brit.*; *ex coll. Sturm*), Chilpancingo in Guerrero (*Höge*, *H. H. Smith*), Tonila in Colima (*Höge*), Cuernavaca in Morelos (*Höge*; *Mus. Oxon.*).

A long series of each sex, the single female in the "Biologia" collection having been left undescribed by Gorham for want of material. The two sexes of this insect are so dissimilar that they might easily be mistaken for different species, *C. dispar* in this respect approaching *C. corvinus*, Gorh., which, however, has the intermediate joints of the antennae much widened in the female. The male has the facies of a small *Leptura*. *C. flavomarginatus* and *C. constrictus* are still more nearly allied forms, the females being sometimes similarly coloured, that of the present species being separable from *C. constrictus* by the more rounded sides of the prothorax and from that of *C. flavomarginatus* by the less expanded margins. Two males have been dissected.

36. *Chauliognathus forreri*. (Plate III, figs. 13,
14, ♂, vars. β, γ.)

Chauliognathus forreri, Gorh., Biol. Centr.-Am., Coleopt. iii, 2, p. 282 (♀).

Hab. MEXICO, Ventanas in Durango [or Sinaloa] (*Forrer* : types), Rincon, Venta de Peregrino, and Tierra Colorada in Guerrero (*H. H. Smith* : ♂ ♀).

Var. α. The elytra with a discoidal fuscous stripe of varying extent, sometimes leaving only the sutural and outer margins flavescens, the dark spots on the head and prothorax (as in some typical *C. forreri*) reduced in number or altogether wanting. (♂ ♀)

Chauliognathus subulipennis, Gorh., loc. cit. p. 282 (♀).

Hab. MEXICO, Rincon in Guerrero (*H. H. Smith* : ♂ ♀), Tehuantepec (*Sumichrast* : types).

Var. β. The dark spots on the head larger, those on the prothorax more extended or confluent (leaving three irregular yellow streaks), the elytra wholly fuscous, the sides below the humeri excepted. (♂) (Fig. 13.)

Hab. MEXICO (*Coffin*, in *Mus. Oxon.*), Chilpancingo in Guerrero (*H. H. Smith*).

Var. γ. Head with two spots between the eyes, and the prothorax with 2, 4, 6, 8 or 9 spots on the disc, black, all these markings sometimes obsolete; elytra with the apical half or two-fifths black, for the rest ochreous. (♂ ♀) (Fig. 14.)

Hab. MEXICO, Huetamo in Michoacan (*Höge*), Venta de Zopilote in Guerrero (*H. H. Smith*).

♂. Aedeagus: median lobe obliquely bent, produced at the tip; left lateral lobe moderately long, stout, concave, dilated towards the base within, and sharply hooked at the tip; right lateral lobe much shorter than the left, compressed, curved and somewhat pointed at the tip. Plate VIII, fig. 39.

The long series of this insect obtained by Höge and H. H. Smith in Mexico connects *C. forreri* with *C. subulipennis*, Gorb., and show that they are forms of one variable species, *C. hieroglyphicus* varying in colour very much in the same way. The present species may be known by its strongly subulate elytra, dull upper surface, the rather prominent hind angles and strongly reflexed margins of the prothorax, the non-prominent eyes in the male, etc. The type is ochreous above, and pale flavous beneath, with two small blackish spots on the head and six others (arranged in two longitudinal series) on the disc of the prothorax, and the antennae, tibiae and tarsi infusate. The legs vary in colour, but the femora are always testaceous at the base. A male of each form has been dissected, showing no variation in the structure of the aedeagus. The femora in this sex are stouter than in the female. The length (excluding head) varies from 9-13½ mm.

37. *Chauliognathus flavomarginatus*, n. sp. (Plate III, fig. 15, ♂.)

Opaque, finely pubescent; head rufescent, flavous in front, with an oblique, sinuous, interrupted stripe on each side between the eyes, extending to the base and converging posteriorly, and the under surface in part, black, the markings often obsolete above; prothorax rufescent on the disc, yellow along the margins; scutellum black, yellow at the apex; elytra flavous, with a broad, oblique, black stripe extending from the shoulder to very near the apex; antennae, apices of the femora, tibiae, and tarsi infusate, the rest of the legs testaceous or rufo-testaceous; under surface in great part pale flavous, the metasternum nigro-fasciate behind, the last ventral segment reddish. Head very large and elongate in ♂, smaller in ♀, the eyes not very prominent; antennae long, rather slender, joint 3 a little shorter than 4. Prothorax about as long as broad, slightly shorter in ♀, sinuate at the sides and distinctly narrowed posteriorly, broadly rounded on each side in front, the hind angles rather prominent, the surface uneven and with a deep median sulcus. Elytra in ♂ a little broader than the anterior portion of the prothorax, long, strongly subulate.

♂. Aedeagus: median lobe obliquely bent, produced at the apex into a rather long spoon-shaped process; left lateral lobe moderately long, compressed, obliquely truncate at the tip, and with the upper apical angle produced into a sharp curved hook; right lateral lobe long, sinuously bent at the tip. Plate VIII, figs. 40, 40a.

Length (excl. head) $8\frac{1}{2}$ – $10\frac{1}{2}$ mm. (♂ ♀.)

Hab. MEXICO, Huetamo in Michoacan (*Höge*).

Seven females and three males, scarcely differing *inter se*, except in the development of the black markings on the upper side of the head. This species approaches *C. forreri*, but has the prothorax strongly dilated anteriorly, deeply sulcate down the middle, and broadly flavo-marginate; the elytra with an oblique dark vitta extending from the shoulder to very near the tips. The aedeagus also very similarly shaped. The following is a more nearly allied form.

38. *Chauliognathus constrictus*, n. sp.

Dull, finely pubescent; head black, more or less yellow in front; prothorax and elytra testaceous, the former margined with yellow and sometimes with a black oblong patch on the disc, the latter infusate on the disc from a little below the base to very near the tip (the infusate portion sometimes becoming bifurcate anteriorly); scutellum testaceous; antennae, apices of femora, tibiae, and tarsi infusate; beneath flavous, the metasternum black across the middle in ♀. Head moderately large in ♂, smaller in ♀, the eyes not prominent; antennae rather slender, long, joint 3 a little shorter than 4. Prothorax slightly sinuate at the sides posteriorly, oblong in ♂, more rounded at the sides in ♀, the surface uneven and with an abbreviated median groove. Elytra considerably wider than the prothorax in ♂, strongly subulate.

♂. Aedeagus: median lobe obliquely bent, spoon-shaped at the tip; left lateral lobe moderately long, rapidly widened towards the base (as seen laterally), sinuous, angularly dilated at about the middle within, the apical portion narrower, obliquely truncate, and feebly hooked at the tip; right lateral lobe long, compressed, distinctly hooked. Plate VIII, fig. 41.

Length (excl. head) $8\frac{1}{2}$ –9 mm. (♂ ♀.)

Hab. MEXICO, Huetamo in Michoacan (*Höge*).

Three males and one female. Very like *C. flavo-marginatus*, and at first sight appearing to be nothing more than a form of that species; but differing from it

in the black head, the less expanded margins of the prothorax, the prothorax itself much narrower and subparallel-sided in ♂, the testaceous humeri and scutellum, and the angularly dilated left lateral lobe of the aedeagus. Two of the specimens have the prothorax immaculate. The somewhat similarly coloured *C. marginatus*, F., has less subulate elytra and a differently formed aedeagus.

39. *Chauliognathus histrio*.

Chauliognathus histrio, Gorb., Biol. Centr.-Am., Coleopt. iii, 2, pp. 75, 281.

♂. Aedeagus: median lobe obliquely bent, slightly produced at tip; left lateral lobe very elongate, sinuous; right lateral lobe about one-half shorter than left, compressed, curved. Plate VIII, fig. 42.

Hab. MEXICO, Durango, Vera Cruz.

Sixteen specimens seen, scarcely varying in colour, the sexes in about equal proportion. *C. histrio* is very like the form of *C. lituratus* with broadly fusco-vittate elytra, and has a similar horseshoe-shaped black mark on the disc of the prothorax; but the elytra in both sexes are greatly abbreviated, and have the apices rather broadly yellow. These two insects have the aedeagus formed as in *C. nigriceps*, and all three have been received from the same locality in Vera Cruz, Playa Vicente. As Gorham states, the present species is very like the N.-American *C. marginatus*, F., now known to extend southward to Nuevo Leon in Mexico; but the latter has stouter and more tapering antennae in both sexes, less abbreviated elytra, a broadly nigro-vittate prothorax, etc.

40. *Chauliognathus nigriceps*. (Plate III, fig. 16, var., ♂.)

Chauliognathus nigriceps, Gorb., Biol. Centr.-Am., Coleopt. iii, 2, pp. 74, 280 (♂ ♀).

Hab. MEXICO; BRITISH HONDURAS; GUATEMALA, Vera Paz; NICARAGUA.

Var. *a.* Elytra narrowly margined with black from a little below the base to near the apex, the black marginal streak often becoming broader posteriorly, thus leaving an indication of a yellow apical spot. (♂ ♀)

Chauliognathus nigriceps, var., Gorb., loc. cit. p. 74.

Hab. MEXICO, Playa Vicente and Cordova in Vera Cruz.

Var. β . Elytra with an anteriorly dilated sutural stripe, and the margins from a little below the base to near the apex, these markings sometimes becoming coalescent beyond the middle, infusate or black (the dark bands thus leaving an oblique stripe extending downward from the shoulder, and a spot at the apex, ochreous). (σ φ .)

Chauliognathus obliquus, Gorb., loc. cit. p. 281, pl. 12, fig. 15 (φ).

Hab. MEXICO (*Mus. Oxon.*), Cerro de Palmas [Plumas] in Vera Cruz.

Var. γ . Elytra black, with about the apical third ochreous; prothorax infusate along the middle of the anterior margin; femora in part testaceous. (φ .)

Hab. COSTA RICA (*Mus. Brit.*).

Var. δ . Elytra black, each with a small ochreous apical spot; the legs and a spot on the disc of the prothorax also black. (σ .)

Chauliognathus apicalis, Gorb., loc. cit. p. 75 (σ).

Hab. MEXICO, Vera Cruz; GUATEMALA, Vera Paz.

σ . Aedeagus: median lobe obliquely bent; left lateral lobe extremely elongate, sinuous, slightly hooked at the tip; right lateral lobe one-half shorter than the left, compressed, narrowed towards the apex. Plate VIII, figs. 43, 43a.

The numerous examples of this variable insect now available for examination (including an interesting series from Mexico in the Oxford Museum) connect the various forms named by Gorham, so that there can be no doubt as to their specific identity. He selected the form with entirely ochreous elytra as the type of *C. nigriceps*. The var. γ is represented by a single example (φ), δ (*apicalis*) by three males, and α and β by long series (σ φ). The legs vary in colour from almost wholly testaceous to black, but the under surface of the body is always in great part flavous. The elytra are greatly abbreviated, leaving the blackish wings and part of the abdomen exposed. *C. nigriceps* comes very near *C. histrio* (which is a form of *C. lituratus* with abbreviated elytra), but the system of coloration of the elytra is constantly different in the darker

forms, the outer limb always remaining flavous in *C. histrio* and black in *C. nigriceps*. The aedeagus of these insects is very similar in structure. The specimen figured (Plate III, fig. 16), from the Oxford Museum, is intermediate between the *C. obliquus* and *C. apicalis* of Gorham.

EXPLANATION OF PLATES III—VIII.

[See *Explanation facing the PLATES.*]